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Original Research Article

Epidemiological characteristics of deceased of Influenza A in a tertiary care hospital at Ajmer, Rajasthan, India

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ABSTRACT

Background: Influenza A (H1N1) is a novel strain of the Influenza virus and is widely known as Swine Flu. It causes a respiratory illness and is very contagious. Symptoms of Influenza A (H1N1) are similar to those of the seasonal flu. First laboratory confirmed Influenza A (H1N1) case of India was reported from Hyderabad on 16th May 2009.
Methods: The study was retrospective descriptive, record-based study and carried in deceased of Influenza A (H1N1) who were admitted in Jawaharlal Nehru Medical College and Hospital, Ajmer, Rajasthan, India from 01 January 2016 to 31 December 2018.
Results: A total 1524 suspected cases were screened for Influenza A (H1N1) at JLN Medical College and Hospital, Ajmer during the period from 1st January 2016 to 31st December 2018. 294 cases were diagnosed as Influenza A (H1N1) positive and 44 died. Majority 25 (56.81%) were belonged to rural area and 30 (68.18%) females died as compare to 14 (31.18%) male.
Conclusions: Incidence and mortality is common throughout the year but it more in winter months. Mortality is high in age group of 50 years and above, females and rural area. IEC activities should be throughout year.

Keywords: Deceased, H1N1, Influenza, Pandemic

INTRODUCTION

Influenza virus is a common human pathogen and it causes serious respiratory illness. It always has potential to cause widespread pandemics whenever a new type of Influenza strain appeared in the human population and then spread easily from person to person.[1] Antigenic drifts are associated with seasonal epidemics whereas antigenic shifts are associated with pandemics. Last pandemic started in 2009 from Mexico and spread globally.[2]

Influenza A (H1N1) is a novel strain of the Influenza virus and is widely known as Swine Flu. It is segmented, enveloped and spherical RNA virus. The virus contains a mixture of genetic material from human, pig and bird flu virus. It is a new variety of flu which people have not had much immunity.[3] It causes a respiratory illness and is very contagious. Symptoms of Influenza A (H1N1) are similar to those of the seasonal flu. Most people who get Influenza A (H1N1) infection, recover within a few days but some people may develop complications. These complications are most likely to occur in people with chronic illnesses, pregnant women, children below 5 years and people who are older than 65 years. Death occurs due to complications.[4] H1N1 cases were confirmed by real time reverse transcriptase polymerase chain reaction (RT-PCR) on throat swab.[5] First laboratory

confirmed Influenza A (H1N1) case of India was reported from Hyderabad on 16th May 2009 and first case of Rajasthan was reported on 23rd July 2009. The pandemic influenza A (H1N1) virus is now circulating as seasonal influenza A (H1N1) virus.[6] According to national centre for disease control in the year of 2018, total cases in India and Rajasthan 15266 and 2375 respectively while total deaths in India and Rajasthan 221 and 1113 respectively.[7] We carried out a retrospective descriptive study in order to study epidemiological characteristics of deceased of influenza A (H1N1) who were admitted in Jawaharlal Nehru Medical College and Hospital, Ajmer, Rajasthan, India.

METHODS

The study was retrospective descriptive, record-based study and carried out at Jawaharlal Nehru Medical College and Hospital, Ajmer, Rajasthan, India. Rajasthan is divided into seven zones, among which one is known as Ajmer zone. Ajmer zone comprises of four districts that is Ajmer, Bhilwara, Nagaur Tonk. Suspected Influenza A (H1N1) cases referred from these districts to JLN Medical College, Ajmer, Rajasthan, India for conformation. Suspected case Influenza A (H1N1) defined as a case with signs and symptoms as per category B and C of influenza-like illness and confirmed case Influenza A (H1N1) defined as a probable case that was tested positive for pandemic influenza A (H1N1) by real-time reverse transcription polymerase chain reaction (RT-PCR). Throat or nasal swab samples of suspected cases of Influenza A (H1N1) with influenza-like illness (ILI) were taken and sent to department of Microbiology, J.L.N. Medical College, Ajmer, Rajasthan, India for confirmation.

The study population included all deceased of Influenza A (H1N1) who were referred from districts of Ajmer zone and admitted in H1N1 ward of Jawaharlal Nehru Medical College and Hospital, Ajmer from 01 January 2016 to 31 December 2018. Information was collected from the case sheets of the cases. The tool used was pretested structured questionnaire. The questionnaire included information regarding socio demographic profile, hospitalization, throat or nasal swab collection and outcome. The data collected was entered on a master chart in Microsoft excel sheet, tabulated and analyzed using Epi info 7. Frequency with percentage were calculated.

RESULTS

Table 1 shows out of 1524 suspected cases were screened for Influenza A (H1N1) at J.L.N. Medical College and Hospital, Ajmer during the period from 1st January 2016 to 31st December 2018. Out of 1524 suspected cases, 294 (19.30%) were diagnosed as Influenza A (H1N1) positive. Out of 294 positive cases of Influenza A (H1N1) 44 were died and case fatality rate was 19.30. In the year 2016 deaths due to Influenza A (H1N1) and case fatality rate of Influenza A (H1N1) were 3 and 30 respectively. In the year 2017 deaths due to Influenza A (H1N1) and case fatality rate of Influenza A (H1N1) were 17 and 9.60 respectively. In the year 2018 deaths due to Influenza A (H1N1) and case fatality rate of Influenza A (H1N1) were 24 and 22.42 respectively.

Table 1: Distribution of Influenza A (H1N1) cases according to microbiological analysis and years.

Analysis	2016		2017		2018		Total	
	N	%	N	%	N	%	N	%
Total	145	100	724	100	655	100	1524	100
Negative	135	93.10	547	75.55	548	83.66	1230	80.70
Positive	10	6.90	177	24.44	107	16.33	294	19.30
Death	03		17		24		44	
Case fatality rate	30		9.60		22.42		14.96	

Table 2: Distribution of Influenza A (H1N1) death cases according to geographical area and years.

Districts	2016		2017		2018		Total	
	N	%	N	%	N	%	N	%
Ajmer	02	66.66	11	64.70	16	66.66	29	65.90
Bhilwara	00	00	01	5.88	00	00	01	2.27
Nagaur	00	00	02	11.76	05	20.83	07	15.90
Tonk	00	00	01	5.88	01	4.16	02	4.54
Pali	01	33.33	01	5.88	02	8.33	04	9.09
Karnataka	00	00	01	5.88	00	00	01	2.27
Total	03	100	17	100	24	100	44	100

Table 2 shows that out of 44 deceased who died in J.L.N Medical College and Hospital, Ajmer during treatment, majority 29 (65.90%) were belonged to Ajmer district followed by 7 (15.90%) Nagaur district and 1 (2.27%) deceased was belonged to Karnataka. Table 3 shows that out of 294 positive Influenza A (H1N1) cases, majority 91 were found in month of September followed by 49 were found in February month, 30 were found in January month, 29 were found in March month and zero case found in July month. Table 4 shows out 44 deceased of Influenza A (H1N1), 30 (68.18%) females died as compare to 14 (31.18%) male between the 1st January 2016 to 31st December 2018. Out of 44 all deceased, majority 17 (38.63%) were found in the age group of 40-60 years and only 1 (2.27%) were in the age group of 10-20 years. Out of 14 males deceased, majority 8 (57.14%) were found in the age group of 50 years and above and no one found in the age group in 10-30 years whereas out of 30 females deceased, majority 12 (40%) were found in the age group of 40-60 years and only 1 (3.33%) were found in the age group of 10-20 years.

Table 3: Distribution of Influenza A (H1N1) cases according to months.

Months	Suspected Case of H1N1	Positive of cases of H1N1	Deaths due to H1N1
January	169	30	08
February	266	49	08
March	171	29	08
April	73	20	03
May	30	10	03
June	31	03	01
July	13	00	00
August	97	23	01
September	375	91	11
October	130	13	00
November	50	03	00
December	119	23	01
Total	1524	294	44

Table 4: Distribution of Influenza A (H1N1) death cases according to gender and age.

Age	Male		Female		Total	
	Number	Parentage	Number	Parentage	Number	Parentage
00-10 years	01	7.14	05	16.66	06	13.63
10-20 years	00	00	01	3.33	01	2.27
20-30 years	00	00	06	20.00	06	13.63
30-40 years	03	21.42	04	13.33	07	15.90
40-50 years	02	14.28	06	20.00	08	18.18
50-60 years	03	21.42	06	20.00	09	20.45
<60 years	05	35.71	02	6.66	07	15.90
Total	14	100	30	100	44	100

Table 5 shows that out 44 deceased of Influenza A (H1N1), majority 25 (56.81%) were belonged to rural area and 19 (43.18%) belonged to urban area. Out of 14 males deceased, majority 8 (57.14%) were belonged to rural area and out of 30 females deceased, majority 17 (56.66%) were belonged to rural area.

Table 5: Distribution of Influenza A (H1N1) death cases according to gender and place of residence.

Residence	Male		Female		Total	
	No.	%	No.	%	No.	%
Urban	06	42.85	13	43.33	19	43.18
Rural	08	57.14	17	56.66	25	56.81
Total	14	100	30	100	44	100

Table 6 shows that out of 44 deceased of Influenza A (H1N1), majority 36 (81.81%) died within 7 days of hospitalization. Out of 36 deceased who died within 7 days of hospitalization, majority 15 (41.66%) were died within 24 hours followed by 12 (33.33%) were died between 4 to 7 days of hospitalization and 9 (25%) were died between 1 to 3 days of hospitalization.

Table 6: Distribution of Influenza A (H1N1) death cases according to time interval between date of admission and death.

Duration	Male		Female		Total	
	No.	%	No.	%	No.	%
>24 hrs	07	50.00	08	26.66	15	34.09
1 to 3 days	03	21.42	06	20.00	09	20.45
4 to 7 days	03	21.42	09	30.00	12	27.27
8 to 14 days	01	7.14	05	16.66	06	13.63
< 15 days	00	00	02	6.66	02	4.54
Total	14	100	30	100	44	100

DISCUSSION

A total 1524 suspected cases were screened for Influenza A (H1N1) at J.L.N. Medical College and Hospital, Ajmer during the period from 1st January 2016 to 31st December 2018. 294 cases were diagnosed as Influenza A (H1N1) positive and 44 died. In present study case fatality rate was reported as 14.96%. Similar CFR 19.10% was found study done by Mahendra Singh et al in 2013 in western Rajasthan whereas 6.09% CFR was found study done by Bharti Malhotra et al in 2015 in Rajasthan.[6,8] High case fatality rate in this study indicates that general population did not benefit from cross protection it may due to high variability of virus.

In the present study shows that majority of positive cases of Influenza A (H1N1) were found in the winter months but highest 91 positive cases of Influenza A (H1N1) were found in September whereas study done by Anupam Mukherjee et al at Eastern India found majority 125 positive cases of Influenza A (H1N1) were found in August and study done by Mahendra Singh et al in western Rajasthan majority 101 positive cases of Influenza A (H1N1) were found in January.[9,6]

In present study it was observed that maximum 68.18% deaths were found in females. Similar finding 67.10% death was observed study done by Singh M et et al, in western Rajasthan. This indicates that this disease is more severe in females and it may due to ignorance and low health seeking behaviour among of females. Majority 38.63% of deceased were belong to age group of 40 to 60 years whereas study done by Ashish Jain et al found that majority 50% of deceased were belonged to age group of 20 to 40 years.[6,2]

In the present study majority 56.81% of deceased were belonged to rural area. Similar study done by Ashish Jain et al in 2017 at southern Rajasthan found that majority 65% of deceased were from rural area whereas study done by Malhotra B et al, in 2015 in Rajasthan reported that majority 63.49% of deceased were belonged to urban area.

More patients belong to rural areas indicate that there is need of public awareness especially in rural areas.[2,8] In the present study majority 34.09% of deceased were died within 24 hours of hospitalization. Similar study done by Modi B et al, found that majority 42.10% of deceased were died within the 24 hours. This may be due the fact that J.L.N. Medical College and Hospital, Ajmer receives most patients in serious condition whereas study done by Ashish Jain et al found majority 35.50% of deceased were died within 1 to 3 days of hospitalization.[10,2]

CONCLUSION

The Influenza A (H1N1) virus is still active after the 2009 pandemic and it seems that it is now endemic in this area. Incidence and mortality is common throughout the year but it more in winter months. Mortality is high in age group of 50 years and above, females and rural area. IEC activities should be throughout year. There should be a chapter regarding of Influenza A (H1N1) for school going children and these children will be act as messenger for society. It may be increase the health seeking behaviour of the people so they can get timely antiviral treatment for influenza-like illness.

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